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MEMORANDUM

To: Kathryn Hernandez (USEPA Region 8) **Date:** February 10, 2003

From: Dr. Jonathan Butcher **Project:** Colorado Mercury

cc: Reed Harris, John Craig (Tetra Tech)

Subject: Watershed Sampling for McPhee Source Assessment **Pjn:** Q500-50-01

The 1999 sampling campaign for the McPhee watershed has enabled an initial estimate of mercury loading rates by sub-basin. The assessment, however, needs additional data to better focus in on the sub-watersheds generating significant sources of mercury load.

One source of data that is expected to be forthcoming is high-elevation snowpack analysis from USGS, which will help to constrain the (winter) atmospheric loading component. In addition, establishing new water and sediment sampling points will help indicate where the loads arise in the mining areas. Better and more place-specific estimates from these areas will provide the basis for field reconnaissance to identify specific source areas for potential remediation.

The previous (1999) sampling round provided a good start, but could not be comprehensive due to available LOE relative to the large size of the watershed. This work demonstrated that there is not one overwhelming source of mercury load; rather the watershed load appears to derive from multiple sources in the Rico, Dunton, and La Plata mining areas. Additional sample locations will further focus the assessment. For the Rico area, in particular, there is a lack of mainstem sampling stations that would help to determine in which areas the major loads arise.

To further refine the assessment, the next round of sampling should include several new sampling locations. In addition, key sampling stations evaluated previously should be re-sampled to confirm and refine previous estimates.

RECOMMENDED NEW SAMPLING LOCATIONS

From seven to nine new sampling locations are recommended. These are divided into several geographic areas:

Dolores River Mainstem/ Rico Mining District

The Dolores mainstem drains the Rico Mining District, which appears to be a major source of mercury

load to McPhee. The 1999 sampling covered many of the smaller tributaries, but had no samples on the Dolores mainstem upstream of MCP-5, just above the confluence with the West Dolores River. Additional sampling points are needed in the mainstem to further constrain the areas of significant mercury loading. Recommended new sampling points (all of which appear to have potential road access) are:

1. Dolores River upstream of Barlow Creek north of Rico. This would provide a boundary condition for the area that appears to be upstream of the historic mining district.

2. Dolores River near settling ponds at Rico, upstream of Silver Creek.

3. Dolores River below Deadwood Creek, south of Rico and downstream of the historic mining area.

4. Stoner Creek above confluence with Dolores River. Stoner Creek enters the Dolores just upstream of existing station MCP-5 and is a major unmonitored sub-watershed. The uppermost reaches of Stoner Creek extend into the Rico mining district, so loading from this area should also be monitored.

West Dolores River

The 1999 sampling includes three stations along the West Dolores (MCP-4, MCP-19, and MCP-3), the first two of which bracket the heart of the Dunton Mining District. However, much of the mercury load appears to come from upstream of MCP-4, while additional load appears to arise downstream of MCP-19. Additional sampling is recommended at the following locations:

5. West Dolores River above Meadow Creek northeast of Dunton. This is upstream of MCP-4 and appears to be the limit of ready road access.

6. West Dolores River upstream of Groundhog Creek, downstream of Dunton. Some mining activity occurred in this area, downstream of MCP-19. A station here would help determine whether additional mercury load occurs in this area.

7. Groundhog Creek above confluence with West Dolores. Not known to be a mining area, but represents significant drainage that can perhaps be confirmed as not a significant source area.

La Plata Mining District

The headwaters of Bear Creek reach into the La Plata mining district. Samples at the mouth of Bear Creek (MCP-7) suggest a significant mercury load. An additional sample would be advisable upstream, near the mining area.

8. ? Upper Bear Creek. Depends on accessibility, which is not readily evident from topo maps.

Other Areas

The major drainage area that is lacking samples is Beaver Creek, which drains to the north side of McPhee. This drainage is estimated to contribute significant flow and sediment loading, so it would be advisable to determine the mercury content of the load.

9. ? Beaver Creek. Accessibility would need to be determined.

RESAMPLING OF EXISTING STATIONS

Of the stations sampled in 1999, those stations that are of key importance in evaluating sub-watershed loads should be resampled to confirm and refine previous estimates. The following seven stations are recommended for re-sampling:

1. MCP-3: West Dolores River near Mouth
2. MCP-4: West Dolores River above Dunton
3. MCP-5: Dolores River above West Dolores River
4. MCP-7: Bear Creek near confluence with Dolores River
5. MCP-11: Silver Creek near mouth
6. MCP-17: Dolores River at Big Bend Boat Launch
7. MCP-19: West Dolores River below Geyser Creek